Graff, the president of the congress, has ascertained that no guarantee has been given for the maintenance of the station by any Government or academy, and that, by the terms of an agreement with the city of Naples, no special rights can be obtained in it by any such body during the period of agreement. Prof. Reinhard Dohrn has assumed the entire responsibility of continuing the work of the station, with the provision that, in the event of his death, the responsibility shall pass to another member of the Dohrn family, and subject to the understanding that the station shall remain a completely international institution, in the benefits of which all countries have the right of participating.

The memorial is to take the form of a portrait in bas-relief, to be placed in the zoological station, and of a fund for promoting the efficiency of the station as an international institution for carrying on research in biology.

The amount collected will be reported in 1913 to the ninth International Congress, which will be asked to formulate the conditions under which the fund shall be handed over to the zoological station. The biologists resident in this country who had signified their sympathy with the proposal to establish the memorial fund, and whose names appear in the international list submitted to the Graz meeting, were invited to attend a meeting which was held in the Natural History Museum, Cromwell Road, S.W., on February 3. As a result of this meeting a number of zoologists, representing the principal centres of research in the British Islands, have been asked to form a sub-committee for the British Empire, in order to assist in the work of the international committee, and of this subcommittee Dr. Sidney F. Harmer, F.R.S., was appointed chairman.

Contributions varying in amount from 5*l.* 5*s.* to 10*s.* 6*d.* have already been paid or promised, and it is hoped that the result of the appeal for subscriptions which is being issued will show that Anton Dohrn's great achievement, the establishment and management of the Stazione Zoologica at Naples, is as fully appreciated here as it is in other parts of the world.

Additional subscriptions may be paid to Prof. S. J. Hickson, F.R.S., of the University of Manchester, who is acting as secretary and treasurer of the British subcommittee. Prof. Hickson will be glad to send a copy of the circular which has been issued to any subscriber whose name has been accidentally omitted in drawing up the list of addresses.

NOTES.

We are asked to state that the annual meeting of the British Science Guild, to be held on Friday, April 7, at the Mansion House, will be opened at 5.0 p.m. instead of 4.0 p.m., as previously announced. The speakers will be:—The Lord Mayor, Viscount Haldane, Sir William White, K.C.B., F.R.S., Sir Albert Spicer, Prof. J. Perry, F.R.S., Dr. R. T. Glazebrook, C.B., F.R.S., Prof. A. D. Waller, F.R.S., and Sir Philip Magnus, M.P.

The Bakerian lecture of the Royal Society will be delivered by the Hon. R. J. Strutt, F.R.S., on Thursday next, April 6, on the subject of "A Chemically Active Modification of Nitrogen produced by the Electric Discharge." The lecture will be illustrated by experiments.

At the anniversary meeting of the Royal Irish Academy on March 16 the following were elected honorary members in the section of science:—Hendrik Antoon Lorentz, Berlin; Max Planck, Berlin; Right Hon. Sir Henry Enfield Roscoe, London; and Charles Sprague Sargent, Cambridge, Mass., U.S.A.

The proposal to establish a museum for London comes at a moment when the subject is better understood than at any other time. Museum work has taken its place in educational requirements, and local history has been shown to be of supreme importance in the development of good citizenship. Of all localities, London is the outstanding city in Britain possessing a history of unique importance. The site of London has been occupied by man since Palæolithic times, through Neolithic times to the historic period when, as a Celtic stronghold, it first became the settlement of a community. As a Roman city, it possesses the finest remains of Roman antiquities in all Britain. Anglo-Saxon, Danish, and later periods are represented by fine series of objects. Remains of beautiful Tudor architecture have been excavated and preserved by the London County Council, which has also preserved and stored every object of interest discovered during its numerous works; the City Corporation has assiduously collected for many years objects discovered in the city, and there are many local collections of considerable interest, both public and private. All this means that there exists already the materials for a London museum from prehistoric to modern times, and it is matter for intense gratification that Mr. Harcourt, when First Commissioner of Works, should have set his hand to this great project and should have carried it through with the aid of a munificent private benefactor. That London should have its own museum of material history as well as its published records is all to the good, though it is late in the day. It is fortunate that the delay in the accomplishment is accompanied by a goodly storehouse of objects awaiting exhibition in a properly organised museum.

Lord Curzon of Kedleston has consented to allow himself to be nominated by the council of the Royal Geographical Society as president of the society in succession to Major Leonard Darwin, who will retire at the anniversary meeting on May 22, after occupying the presidential chair for three years. The annual dinner of the society will be held this year in the Great Hall of the Hotel Cecil on May 26.

A Reuter message from Paris on March 25 states that M. Sommer, the aviator, has made a flight at Mouzon in a biplane with twelve passengers on board, the total weight being 1439 lb.

By direction of the London County Council, a tablet has been affixed to No. 32 Soho Square (the National Hospital for Diseases of the Heart), where for many years lived Sir Joseph Banks, who for forty-one years—from 1778 to 1820—was president of the Royal Society.

The meetings of the Institution of Naval Architects will be held at the Royal Society of Arts on April 5–7. In consequence of the death of the late president of the institution, Earl Cawdor, the annual dinner will not be held this year. On April 5 the presentation of the institution premium to Mr. T. B. Abell will be made.

A brass tablet to the memory of the late Mr. Cox has been placed in the Hackney Town Hall. The tablet, which was provided by residents in Hackney, bears the words:—"In honour of Harry William Charles Cox, consulting electrician, who died at Hackney July 9, 1910. He contracted a malignant disease while perfecting apparatus for adapting the X-rays to the relief of human suffering."

The Bessemer gold medal of the Iron and Steel Institute will this year be awarded to Prof. Henri Le Chatelier, the eminent French metallurgist, in recognition of his

great services in the advancement of metallurgical science. The presentation will be made by the Duke of Devonshire, president of the institute, at the annual general meeting to be held in London in May. The Andrew Carnegie gold medal for 1910 will also be awarded at the same meeting, the recipient being M. Felix Robin, Paris.

THE death is announced of Prof. Kekule von Stradonitz, the Berlin archæologist. He was born at Darmstadt in 1839, and took his degree at Berlin in 1861. He then travelled for several years in the Mediterranean, studying Greek and Greco-Roman antiquities. In some monographs on the Theseion in Athens, and on one of the groups in the Villa Ludovisi, he first developed his methods of research. Early in the 'seventies of last century he was appointed to a professorship at Bonn University, and while here he published two important works, one on Tanagra figures and the other on ancient terra-cottas. In 1887 he was appointed director of the sculptures in the Royal Museums, and later to the professorship of classical archæology, and he held both posts until his death.

A PAPER was read before the Society of Antiquaries on March 23 by Messrs. H. E. Balch and D. R. Troup on the exploration of a late Celtic and Romano-British cave-dwelling at Wookey Hole, Somerset. This is close to the Hyæna Den, explored by Prof. Boyd Dawkins fifty years ago. Beneath a small accumulation of surface material was the Roman deposit, containing coins ranging from Vespasian to Valentinian II. Below this, relics of the domestic life of the cave-dwellers were unearthed—a silver earring with the left frontal bone of a girl, and a large series of iron articles. Charred grain and pulse, together with burnt acorns, throw light upon the limited agriculture of the period. The human remains present a problem, and it is practically certain that the persistent occurrence of these along with waste food-bones indicates cannibalism. The excavations are in progress, and will, it may be hoped, throw further light upon these interesting discoveries.

NATURALISTS throughout the world have an opportunity of showing their appreciation of the labours, and regard for the personality, of the late Dr. Anton Dohrn, by contributing to the international memorial fund referred to elsewhere in this issue. It is proposed to place a portrait of Dohrn in bas relief in the Zoological Station which he founded at Naples, and to establish a fund which will ensure the continued efficiency of the station as an international laboratory of biological research. No memorial to Dohrn could have more worthy or appropriate objects, and we hope that naturalists in the British Empire will give a ready and generous response to the subcommittee's appeal for contributions to it. Subscriptions may be sent to Prof. S. J. Hickson, F.R.S., University of Manchester.

THE report of the advisory committee for the Tropical Diseases Research Fund for 1910 has recently been issued, and contains matter of considerable interest. The fund administered in 1910 amounted to 3245*l.*, and is derived from contributions by the Imperial Government, the Government of India, and various Dominion and Colonial Governments, and is expended on grants to the London and Liverpool Schools of Tropical Medicine, and the Universities of London and Cambridge. Reports are included on the work being done and on the manner in which the grants have been expended. Dr. Wenyon records observations on a malady, "Oriental sore," in Bagdad, and some evidence is adduced that the disease is conveyed by a mosquito, a Stegomyia, sp. Dr. Castellani, of Colombo, records cases of bronchitis in Ceylon caused by an Oidium fungus.

THE seventh International Congress against Tuberculosis is to be held in Rome on September 24–30 next. The English section is being organised by the National Association for the Prevention of Consumption and other Forms of Tuberculosis, 20 Hanover Square, W. All the universities and principal towns in the United Kingdom have been invited to send delegates. An executive committee has been formed for the purpose of arousing interest in the congress in this country, and for collecting suitable material in connection with the subject. Dr. J. J. Perkins will act as honorary secretary of this committee. A representative national committee has also been formed, and many distinguished persons have joined it. The congress next September will be divided into three principal sections to deal with the following subjects:—(*a*) etiology and epidemiology of tuberculosis; (*b*) pathology and therapeutics (medical and surgical) of tuberculosis; (*c*) social defence against tuberculosis.

THE sixty-fourth annual meeting of the Palæontographical Society was held in the Geological Society's rooms at Burlington House on March 24, Dr. Henry Woodward, F.R.S., president, in the chair. The annual report referred to the approaching completion of the monographs of Carboniferous Palæoniscid Fishes, English Chalk Fishes, Cretaceous Lamellibranchs, and British Graptolites. The volume for the year included not only instalments of these works, but also a small, complete monograph of British Carboniferous Arachnida, by Mr. R. I. Pocock. Small monographs of special groups of fossils appeared to be acceptable to the members. The Carnegie Trust for the Universities of Scotland had given to the society the plates illustrating the Carboniferous Palæoniscidæ described by Dr. Traquair. Mr. H. Dewey, Mr. Upfield Green, Dr. A. W. Rowe, and Dr. A. Strahan were elected new members of council. Dr. Henry Woodward was re-elected president, and Dr. G. J. Hinde and Dr. A. S. Woodward were re-elected treasurer and secretary respectively.

WE have received a copy of the third edition of the little book on the Brent Valley Bird Sanctuary, by Mr. Wilfred Mark Webb, the chairman of the Sanctuary Committee and honorary secretary of the Selborne Society. It contains a very fully illustrated account of what has been done in an enclosure of nineteen acres which comes into the London postal district, and those who wish to induce the feathered visitors to their gardens to stay and nest as the spring comes on may obtain from it a number of hints. The price of the book is 7*d.* post free (or in paper boards 1*s.* 1*d.*), and it can be obtained from the secretary of the Selborne Society at 42 Bloomsbury Square. The whole of the sixpence or shilling received goes towards the upkeep of the sanctuary.

MR. T. SHEPPARD, curator of the Hull Museum, in his last quarterly report announces the discovery of a series of Neolithic workshops near Bridlington, the scene of the fabrications of the notorious "Flint Jack," which were suggested by the importance of earlier discoveries in this neighbourhood. The material used by these prehistoric craftsmen was chiefly the black flint found in boulders occurring in the glacial clays and gravels ultimately derived from the bed of the North Sea or from its eastern coasts. Mr. Sheppard has now found a vast number of cores, spoilt flakes or "wasters," and flint-knives under the Bridlington cliffs. One worker seems to have made

a speciality of the pink flints, and some specimens resembling the "pygmy" type have been recognised. The finds now announced include oval or pear-shaped scrapers, a second type possibly used for straightening arrow and spear shafts, and a curved implement, which is believed to have been used as a sickle. These implements are now ready for examination by archæologists in the Hull Museum.

IN vol. ii., part iii., of Records of the Albany Museum, Mr. J. Hewitt gives a descriptive account of the South African Batrachia, with supplemental notes on the distribution of the various species.

The American Naturalist for March contains two articles on the "genotype" theory of heredity, the one, by Prof. W. Johannsen, dealing with the conception as a whole, while the second, by Prof. E. M. East, treats the hypothesis in connection with hybridisation. After stating that the genotype theory may prove insufficient, or even erroneous, the former author observes that heredity may be defined as the presence of identical genes in ancestors and descendants, or, as Mageen says, in full accordance with this definition:—"The word heredity stands for those properties of the germ-cells that find their expression in the developing and developed organism."

To the *Verhandlungen schweiz. naturfor. Gesellschaft* for 1910 Dr. F. Sarasin contributes a note on the fauna of the Galapagos Islands, in which particular attention is directed to the flightless cormorant, *Nannopterum harrisi*, and the penguin, *Spheniscus mendiculus*; the latter, which is by far the most northern member of its kind, being regarded as a relict of a former extension of the southern ice. The author supports Baur's view as to the continental origin of the Galapagos group, and suggests that its union with the mainland lasted until North and South America were themselves connected by land, but at a period when there was a temporary sundering by means of an arm of the sea, thereby permitting the influx into the Galapagos area of forms from the Carribean coast and the Antilles.

To Mr. J. D. Hamlyn, the well-known animal importer, we are indebted for a copy of a circular containing reference to additional reports in regard to the African "water-elephant." When in French Congo, in 1905, Mr. Hamlyn came across a Panguin hunter who gave an account of a large water-animal inhabiting a lake in the Fernan Faz (Fernand Vaz) district, unvisited by any white man, and not far distant from the coast. It was described as intermediate in size between a hippopotamus and an elephant, with a thick, hairy hide, but no tusks. These animals spend most of their time in the water, and can stay beneath the surface for considerable periods; they are dangerous to approach, and are never hunted by the natives. It may be added that rumours are current of an apparently similar animal inhabiting lakes in northern Rhodesia, and known to Europeans as "water-rhinoceroses," and that in the first edition of the "Encyclopædia of Sport" Colonel F. T. Pollok, in the article Tapir, stated that he had actually seen one or two of these animals below the Congo, and referred to mention of them in 1894 by Captain H. Bailey in "Travel and Adventures in the Congo Free State."

To the *Verhandlungen schweiz. naturfor. Gesellschaft* for 1910, vol. i., Dr. H. Stehlin contributes observations on the evolution and dental development of various ungulates from the lower Tertiary *Bohnerz* of Switzerland. As we proceed from the lower to the higher stages of this formation, a progressive increase in the size of the different species of various groups, accompanied by an increasing dental specialisation, is very noticeable. *Dichodon ruetimeyeri*, for instance, passes, as regards size, through *cartieri* into *subtilis*, with a gradual increase in the length of the crowns of the first three premolars, and the conversion of the fourth of that series from a triangular into a quadricolumnar tooth; and a progression in the matter of general size and the complexity of the fourth upper premolar is observed in species of the genera Lophiotherium and Palæotherium. In the concluding portion of the paper the author points out that there is evidence of free communication between the Old World and North America during the early Eocene, after which there was a sundering of the two continents, while union was once more resumed in the Oligocene. Africa during the Eocene seems to have had no direct communication with Europe, the relationship between the European early Tertiary lemuroids and the modern lemurs of Africa being capable of explanation by means of a land-connection by way of Asia.

THE February number of *The Quarterly Journal of Microscopical Science* (vol. lvi., part ii.) consists chiefly of a long memoir, by Prof. F. H. Edgeworth, on the morphology of the cranial muscles in some vertebrates. In this paper Prof. Edgeworth discusses the very difficult and intricate problem of the segmentation of the vertebrate head. He points out that the probable phylogenetic relationships of the various vertebrate groups are determined by the total morphological evidence available, and that the cranial muscles form one item only of such evidence. The interpretation of this evidence is, moreover, rendered very difficult by secondary modifications which have arisen during phylogeny, such as secondary innervation, convergent evolution and degeneration, and in arriving at any conclusion it is necessary to take into account the development as well as the adult structure. The conclusion at which the author actually arrives is that the morphology of the cranial muscles is in favour of an amphibian ancestry of mammals. This result, however, is only reached by considering the sauropsidan features of the cranial muscles as secondary phenomena, and it appears to us that it can hardly be reconciled with the evidence derived from other embryological characters, and, above all, from the geological record.

IN describing a collection of Tertiary insects from the lacustrine deposits of British Columbia, in the second volume of Contributions to Canadian Palæontology, Mr. Anton Handlirsch directs attention to the prevalence of certain groups of flies, especially those of the bibionid section, which appear to have formed the chief element in the insect fauna. These are represented exclusively by the genus Penthetria, which at the present day includes, throughout the world, scarcely more species than those in the collection forming the subject of the paper. While the number of fossil Canadian species is estimated at about thirty-five, the existing forms of Penthetria are thirty-six, the allied genus Bibio including ninety-five. "The occurrence of so disproportionately large a number of penthetrias in the Tertiary of British Columbia contemporaneously with the absence of Bibio indicates that the beds in question belong to the early Tertiary, and are at least Oligocene in age. The supposition is obvious that the genus Bibio originated in the East, probably in Europe, and later found its way into North America." It is added that the occurrence of Penthetria and certain other genera indicates that British Columbia enjoyed a warm climate in the Oligocene.

SOME interesting abnormalities in the flowers of Œnothera are recorded by Dr. R. R. Gates in the twentieth report of the Missouri Botanical Garden. The transformation of the sepals into green leaf-like organs, known as virescence or frondescence, and general modification of the floral organs, appeared in several species, notably in *Œnothera multiflora*. Polymery, or an increase in the number of parts, was manifested in certain hybrids of *O. Lamarckiana*; a curious feature was the occurrence of trimerous flowers side by side with a tetramerous and a heptamerous flower. In some cases there were evident signs of coalescence of two flowers, or synanthy.

NATURAL cross-fertilisation among plants in India forms the subject of the latest botanical issue (vol. iii., No. 6) of the Memoirs of the Department of Agriculture in India, compiled by Mr. and Mrs. A. Howard and Mr. A. Rahman Khan. It is noted that natural crossing among wheat plants, which is very rare in England, but is somewhat more frequent in the drier climates of Europe and North America, becomes more common under the much drier conditions prevailing at Lyallpur. The conclusion follows that wheat breeding in the canal colonies of the Punjab will necessitate the exercise of special precautions. Among the various observations recorded as examples of variation due to natural crossing are colour variations in *Lathyrus sativus*, change of form in tobacco plants, and petal modifications in the opium poppy.

ABOUT four years ago a first catalogue of fifteen pieces of apparatus designed by Prof. W. F. Ganong to serve as instruments for precise measurements in vegetable physiology was issued by the Bausch and Lomb Optical Co., Thavies Inn, Holborn Circus. Those instruments included demonstration clinostat, portable clamp stand, normal light screen, respirometer, leaf-clasp, and bell-jar support. A short supplement to the former catalogue has recently been published, in which new instruments in the form of two space markers and a demonstration auxograph are described. The more useful space marker for root-growth measurements consists essentially of a wheel fitted with a ribbed rubber rim, the ribs being spaced 2 mm. apart. The auxograph is a continuous recording instrument, in which the adjustment of the connection between the growing organ of the plant and the recording pen and other details are carefully devised.

THE survey of the Philippine Islands has advanced steadily since it was undertaken by the Coast and Geodetic Survey of the United States ten years ago. A considerable length of coast-line has been accurately located by triangulation, and a belt of country along it has been surveyed topographically. The hydrographic survey of the waters between the numerous islands has also been vigorously pushed on, 120 charts having already appeared. A map showing the present state of the work appears in the January number of *The National Geographic Magazine*.

THE first number of the Technical Review of the Venezuelan Ministry of Public Works mainly consists of official decrees and regulations, but a small amount of information relating to the country appears in the form of communications from commissions entrusted with exploration of eastern and western Venezuela. The geographical positions of sixteen places in the district of Lara were astronomically determined, and a few notes on the geology and meteorology are added. Similar data are furnished from the country to the southward, and the meteorological observations taken at the Observatory of Cajigal in 1908 are included.

A SUMMARY of the state of the ice in the Arctic sea during the summer of 1910 has been published by the Danish Meteorological Institute. The White Sea was open early, and in the Barentz Sea also the winter ice broke up in May, though the polar ice remained dense. Round Spitsbergen conditions were severe, but in the Greenland Sea, on the other hand, they were normal, and the coasts of Iceland were almost free from ice, though in April and May it was not far from the north-west of the island. The opinion is expressed that there will probably be much ice this spring in the Barentz Sea and to the south of Spitsbergen, while normal conditions are anticipated in Davis Strait, Baffins Bay, and to the east of Newfoundland.

MR. H. J. MACKINDER, M.P., lectured on Monday, March 27, before the Royal Geographical Society on the subject of "The New Geography, its Aims and Methods," wherein he reviewed the present outlook of the geographer in this country and compared it with that of four-and-twenty years ago, when he last discussed the scope of geography before the society. After stating that the geographer in his maps sees the earth's surface and its form, that he studies its history, and appreciates the influence of this upon man, his distribution, development, and history, the lecturer went on to demonstrate that with such an outlook geography became an independent subject of study, teaching, and research. By means of a few selected instances the influence of the physical character of a district on its human history was shown, and the ineffectiveness of historical study without a clear perception of the physical controls was insisted upon. Education on such comprehensive lines may be trusted to give a width of outlook and a power of visualising the relations of a number of factors which must give added power in any branch of knowledge. Research can find ample scope in investigating the effect of the relations between the various physical and human factors, thus furnishing a firm basis for the generalisations of the geographer; and for those whose interest is directed to special branches of the subject, the critical examination of problems arising in them affords opportunities for every geographer so long as he bears in mind its relation to the subject as a whole, and would not restrict the subject to the limits of that portion in which his interest lies.

THE Transactions of the Geological Society of South Africa include (vol. xiii., 1910, pp. 65–92, Plates ii.–ix.) an interesting paper, by Mr. C. B. Horwood, on the carbon found in the banket of the Rand. Mr. Horwood holds that there is some close connection between the presence of the carbon and that of the gold. He holds that the carbon has been deposited, at least in its present position, by secondary action, and that the carbon was probably introduced as a hydrocarbon. He quotes, with apparent approval, Mr. Coste's view that petroleum has a solfataric volcanic origin. Mr. Horwood holds that the carbon at the Rietfontein Mine is usually an indication of the presence of visible gold, and that "where carbon is present good gold values may confidently be expected." According to his account, it appears that it is only occasionally that carbon can be detected in the pay-reefs, and that it is only on the Rietfontein and the Randfontein Mines on the Rand that sufficient carbon occurs to be a characteristic feature of the banket. Carbon is apparently most abundant in the abandoned Buffelsdoorn Mine, which, however, is at Klerksdorp, and not on the Rand. Mr. Horwood's valuable analyses throw doubt on his view that the carbon has been the precipitant of the gold owing to

the very sparse occurrence of the carbon and the lack of agreement between the amounts of carbon and gold. Thus, according to Mr. Horwood's table of analyses of samples from the West Reef dyke of the North Randfontein Mine (Appendix D, p. 92), one of the three specimens containing the highest percentages of carbon had the smallest weighable quantity of gold, and of the two specimens with the highest percentage of gold one had only a trace of carbon, and the other was one of the lowest in carbon in the whole series. Mr. Horwood bears fresh testimony to the fact that throughout the Rand good values are almost invariably found when pebbles of a pinkish-brown quartzite occur in the banket.

To the *Sitzungsberichte* of the Vienna Academy of Sciences (July, 1910), Dr. W. Schmidt contributes a lengthy investigation on thunderstorms and squalls, rapid rises of barometric pressure. The work is divided into two parts:—(1) the observations and results of sixteen months' records of the variometer at the Central Meteorological Office at Vienna, especially with reference to the cases of rapid rises mostly caused by squalls, &c.; (2) experimental investigations of the incursion of heavier (colder), under lighter (warmer) air, and its effect on the formation of the squalls. The latter subject constitutes the essential part of the whole investigation, and this inflowing of the cold air, the author states, never takes place in the form of a simple wedge, but the front portion has the shape of an uplifted head (illustrated in the diagrams). "This head, with the currents that it causes, is the core of the squalls and thunderstorms. In these we cannot therefore speak of an actual whirl with horizontal axis." He considers that another theory must be substituted for the old one, which would explain all the phenomena in squalls essentially by the motions which, under the influence of gravity, must take place from the juxtaposition of two layers of air at different temperature.

THE *Zeitschrift für den physikalischen und chemischen Unterricht* issues from time to time special parts dealing with the method of teaching and the philosophy of science. In a part of 120 pages, which has recently appeared, Dr. H. Lüdtke, of the Modern High School (Real-Gymnasium), Altona, gives details of a course on electrical oscillations and the electromagnetic theory of light suitable for the older pupils in modern high schools. It includes construction of a Tesla transformer, experiments to show the repulsion of a metal disc and other mechanical actions of the currents obtained, together with their thermal, optical, chemical, and physiological effects. The portions of the theory of alternating currents necessary for the study of the theory of light are then introduced, and are followed by experiments on electrical oscillations, their interference, diffraction, and polarisation. The course is well thought out, both theoretically and experimentally, and will commend itself to those high-school teachers in this country who have the time and apparatus necessary for the preparation of a course on the subject, and the pupils capable of benefiting from such a course.

A SMALL portable photometer, known as the "Holophane Lumeter," for determining the luminosity of surfaces, has been constructed by Messrs. R. and J. Beck. It measures $8\frac{1}{2}$ by $2\frac{3}{4}$ by $2\frac{3}{4}$ inches, and is divided into two chambers, the first of which contains a small electric lamp run from two storage cells. The light from this chamber, the walls of which are painted white, passes through a small opening into the second chamber, which contains the circular photometer screen. The matt-white surface of the screen is viewed through an eye-piece inserted obliquely into the side of the chamber. The surface the luminosity of which is to be determined is seen through an opening in the centre of the screen, and a corresponding one in the end of the chamber. Two sectors, one notched, the other plain, can be moved over the aperture between the two chambers until the brightness of the outer part of the photometer screen is equal to that of the central part. The luminosity of the surface viewed is read on two scales outside the box, over which two pointers connected with the sectors move. One scale reads up to 0·1 and the other to 1·0 candle foot. By means of dark glass screens interposed in the path of the light coming from the surface tested, the readings may be extended up to 100 candle feet. The instrument is standardised by being made to read 1·0 when directed to a white surface 1 foot away from a standard candle.

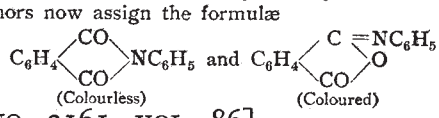
MESSRS. NEWTON AND CO., 3 Fleet Street, have just issued a new price-list of X-ray, high-frequency, and electro-medical apparatus. The X-ray apparatus shows evidence of development in several directions. The "Snook" apparatus consists essentially of a step-up transformer immersed in a tank of oil. The primary receives alternating current from a dynamo, which is worked from the electric supply mains. A simple mechanical high-tension commutator is placed in the secondary circuit, and renders the secondary charge unidirectional. The axis of the commutator is continuous with the axis of the dynamo, and thus perfect synchronism must necessarily result. From a convenient switch table the secondary discharge can be regulated from a very small to a very large one. The introduction of this apparatus has led to modifications and improvements in all other forms of generating apparatus; coils have been constructed with a large amount of metal in the core, and a comparatively thickly wound secondary, so as to be capable of giving large discharges comparable with those obtained from the secondary of the "Snook." Mechanical and electrolytic interrupters have also been developed and enlarged in such a way as to enable large primary currents to pass through them.

No marked development has taken place in X-ray tubes in recent years, but there are several on the market now which are able to stand a heavy secondary discharge, and thus enable skiagrams of the thicker parts of the body to be taken with very short exposures. The accessory apparatus described in Messrs. Newton and Co.'s list referred to above includes certain devices for the protection of the operator. One of these is a lead-lined cabinet in which the observer and one or two others can incarcerate themselves while the X-ray tube is in action. The switch-board is placed in the cabinet. A cabinet of this sort was introduced some years ago by Dr. Albers-Schönberg, of Hamburg. Its utility is confined to cases in which X-ray treatment is to be given, or an X-ray photograph is to be taken, though it is obviously of no use for fluorescent-screen observation, a most important part of diagnostic X-ray work. For protecting the operator during fluorescent-screen operations, Dr. Jordan's adjustable lead-lined screen is illustrated, and also the revolving saddle upon which the patient is seated during the use of this lead-lined screen. Several old patterns of tube stand are still figured in which the X-ray tube is not enclosed in a protective shield or box. Thus on p. 69 two naked X-ray tubes are shown supported by a single jointed clamp. No X-ray tube should ever be used in this unprotected state at the present day, and it would have been better to have omitted such stands from the price-list, as they are a source of danger to those who use them.

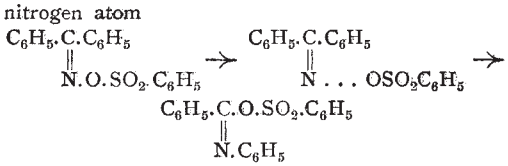
UNDER the title "Chemische Weltliteratur," Dr. Wilhelm Ostwald communicates an article to the current number of the *Zeitschrift für physikalische Chemie* which raises a question of very general interest. He points out that the convention under which all scientific publications are published in one of the three "great" languages (English, French, or German) shows signs of breaking down. Partly through an increased sense of nationality, partly through the difficulty of writing freely in a foreign tongue, numerous valuable publications are now published in Italian, Spanish, Russian, Polish, and other languages. This tendency renders it difficult, if not impossible, for a worker in any given branch of science to learn what has already been done in his own subject. Dr. Ostwald then discusses the possibility of an agreement on an international speech for scientific publications. Owing to the large number of new conceptions and terms, the use of Latin for this purpose is no longer possible, and *Ido*, an improved and developed Esperanto, is suggested as a solution. A general outline of this artificial language is given, and a nomenclature especially adapted to chemistry is sketched out. The subject is one which might well receive attention at international scientific congresses, and if it were possible to arrive at a general agreement, even in one or two isolated sciences only, a real step in the diffusion of science would be made.

WE have received from the publishers, Gebrüder Borntraeger, of Berlin, the first number of a new magazine entitled *Internationale Zeitschrift für Metallographie*. Although published in Berlin and edited by Dr. Guertler in that city, the new journal aims at an international character, and the list of collaborators includes the names of the leading workers in metallography in this country, as well as in Germany, America, Sweden, and Italy. The journal is intended for the publication of papers in German, English, or French dealing with the whole range of metals and alloys, each paper being accompanied by a brief abstract in all three languages. If the new journal can secure the necessary contributions in such a way as to avoid the wide scattering of metallographic papers which now occurs, it will prove extremely useful. It is, however, recognised that British authors who are accustomed to present their work to scientific or technical societies will not be able to abandon these in favour of the magazine; such papers are therefore either to be reprinted in full or to be fully abstracted. The present number of the journal contains introductory matter by the editor, and two papers of some interest, one by Profs. Heyn and Bauer (Berlin) on internal stresses in cold-wrought metal, and the other by Prof. Mathewson (U.S.A.) on sodium-silver alloys. The experiment of establishing an international journal of this kind is an interesting one; if successful, it may lead to similar developments in other branches of science.

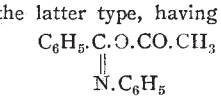
A RECENT issue of the Memoirs of the College of Science and Engineering, Kyoto Imperial University, contains two interesting papers on isomerism of different types. In the first paper, by Prof. Kuhara and Mr. Komatsu, on isomeric phenylphthalimides and some allied compounds, the authors describe a number of pairs of isomeric derivatives of phthalimide. The parent substance is only known in one form, but phenylphthalimide has been obtained in colourless needles melting at 83°–84°, and in yellow rhombic crystals melting at 125°–126°. To these the authors now assign the formulæ



Similar formulæ are assigned to the colourless and yellow isomeric compounds prepared by the interaction of phthalyl chloride with six substituted anilines, and also to the colourless and yellow *p*-methoxy- and *p*-ethoxy-phenylphthalimides prepared some years ago by Piutti and Abati. The isomeric compounds yield identical derivatives when acted upon by the Grignard agent. The second paper, by Prof. Kuhara and Mr. Todo, deals with the Beckmann rearrangement. The authors conclude that the interchange of radicles which takes place, *e.g.*, by the action of benzenesulphonic chloride on benzophenone-oxime is due to the dissociation of an acid radicle from the nitrogen atom



A compound of the latter type, having the formula



has actually been prepared as an unstable yellow oil, and has been shown to pass over at once into benzanilide when acted on by hydrochloric acid.

THE new edition—the third—of Prof. Karl Pearson's "Grammar of Science" is to be issued by Messrs. A. and C. Black in two volumes, the expansion of the text having rendered it too large for one volume. There will be an entirely new chapter dealing with birth-rates, race suicide, and degeneracy. The first volume will be published immediately, and the second volume in the autumn of this year.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES FOR APRIL:—

April 1. 5h. 45m. Venus in conjunction with the Moon (Venus 0° 14′ N.).
9. 7h. Neptune at quadrature to the Sun.
14. 15h. Mercury at greatest elongation east of the Sun (19° 42′ E.).
14. 17h. 6m. Jupiter in conjunction with the Moon (Jupiter 1° 41′ N.).
19. 23h. Uranus at quadrature.
23. 13h. 11m. Mars in conjunction with the Moon (Mars 3° 45′ N.).
24. 20h. Mercury stationary.
28. 10h. 16m. Sun eclipsed, invisible at Greenwich.
28. 14h. 46m. Saturn in conjunction with the Moon (Saturn 2° 17′ S.).
29. 10h. Venus in perihelion.
30. 16h. Jupiter at opposition to the Sun.
30. 18h. Saturn in conjunction with the Sun.

OBSERVATIONS OF THE ZODIACAL LIGHT.—Some interesting observations, illustrated by sketches, of the Zodiacal Light are recorded by Herr Hoffmeister in No. 4484 of the *Astronomische Nachrichten*. The observations were made at Sonneberg, Thüringen, during February and March, 1910, when, it will be remembered, the light was particularly visible during the apparition of comet 1910*a*, which is shown on one of Herr Hoffmeister's sketches (February 3). On this date, at 7h. 10m. (M.E.T.), the summit of the brightest portion of the Light was at $\alpha = 17°$, $\delta = +10°$, and on March 5, at 8h. (M.E.T.), it lay in the position $\alpha = 33{\cdot}5°$, $\delta = +15{\cdot}5°$; Herr Hoffmeister also gives the positions of a number of points marking the northern and southern limits. To provide a scale for the brightness of the various parts of the Light, Herr Hoffmeister selects and names various parts of the Milky Way with which he compared it; this scale, of five steps, should prove useful in making comparisons of the Light from time to time.